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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,006	12/30/2003	Mika Ebihara	S004-5182	9318

7590

04/04/2005

ADAMS & WILKS

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EXAMINER

KANG, DONGHEE

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/750,006

Applicant(s)

EBIHARA, MIKA

Examiner

Donghee Kang

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 March 2005.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.  
4a) Of the above claim(s) 5-7 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-4 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 5-7 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 03-21-05.

### ***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 12-30-05. It is noted, however, that applicant has not filed a certified copy of the 2003-006629 application as required by 35 U.S.C. 119(b).

### ***Claim Objections***

3. Claims 1-3 are objected to because of the following informalities: The term "reverse conductivity type" is not common term for the semiconductor industry and make it unclear. The examiner suggests "opposite conductivity type" instead of reverse conductivity type. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 & 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumikiyo (US 2002/0175375) in view of Havemann (US 6,753,563).

Re claim 1, Kunikiyo teaches a semiconductor device comprising (Fig.2):

a field oxide film (26) formed on a semiconductor substrate (4n, p-type) of one conductivity type; a gate electrode (6) through a gate oxide film (20) on the semiconductor substrate of one conductivity type, which is surrounded by the field insulation film; a low concentration source/drain region (19n) of a reverse conductivity type (n-type) formed in a region surrounded by the field oxide film and the gate electrode; an interlayer film (27) for electrically isolating the gate electrode and the low concentration source/drain region of the reverse conductivity type from a wiring formed thereon; a contact hole formed in the interlayer film for electrically connecting between the wiring, and the gate electrode and the low concentration source/drain of the reverse conductivity type (see also Figs.1 & 3); and a high concentration diffusion layer (18n) of a reverse conductivity type selectively formed only in the low concentration source/drain region of the reverse conductivity type where the contact hole is formed. See also paragraph 0081-0090.

Kumikiyo does not teach a nitride film formed for preventing the semiconductor substrate from being overetched when forming the contact hole in the interlayer film. Havemann teaches in Fig.1 forming nitride layer (32) to eliminate damage of semiconductor substrate during the formation of contact hole 30 (Col.4, line 65-Col.5, line 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the nitride layer of Havemann into the Kumikiyo's device since the nitride layer reduces or eliminates damage of semiconductor substrate during the formation of contact hole in the interlayer film.

Re claim 4, Kumikiyo as modified by Havemenn does not teach the nitride film has a film thickness of 100 to 500 Å.

It is an obvious matter of routine experimentation to find the optimal thickness ranges. Generally, difference in thickness will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such thickness is critical. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the thickness of the dielectric layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

6. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunikiyo (US 2002/0175375) in view of Havemann and further in view of Kunikiyo (US 6545318).

Kunikiyu ('375) as modified by Havemann does not teach an impurity concentration of low concentration and high concentration source/drain region. Kunikiyo ('318) teaches the low concentration and high concentration source/drain region have the impurity concentration which is in the claimed ranges (Col.4, lines 58-64). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the thickness of the dielectric layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the

optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 571-272-1656. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Donghee Kang, Ph.D.  
Primary Examiner  
Art Unit 2811

dhk